REMARKS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1, 7-11, and 24-34 are presently pending in the present application. Claims 1, 7, and 9 have been amended and Claims 24-34 have been added by way of the present Amendment. No new matter has been entered. (See, e.g., original Claim 6, page 8, lines 12-21, and Figure 1.) The new claims read on the elected species. Claims 2-6 and 12-23 have been canceled without prejudice or disclaimer.

In the outstanding Official Action, Claims 12-23 were withdrawn from consideration, and the election requirement made final. As noted above, withdrawn Claims 2-23 have been canceled without prejudice or disclaimer; however, the Applicants reserve the right to file one or more divisional application directed to non-elected species.

In the outstanding Official Action, Claims 1-3 and 11 were rejected under 35 U.S.C. §103(a) as being unpatentable over Okamoto (U.S. Pub. No. 2002/0182460) in view of Müller et al. (U.S. Patent No. 6,777,116). Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Okamoto in view of Müller et al. and Zhang et al. (U.S. Pub. No. 2003/0110841). Claims 5 and 6 were rejected under 35 U.S.C. §103(a) as being unpatentable over Okamoto in view of Müller et al. and Pan et al. (U.S. Pub. No. 2004/0110046). Claims 7 and 8 were rejected under 35 U.S.C. §103(a) as being unpatentable over Okamoto in view of Müller et al. and Yonestu et al. (U.S. Patent No. 6,506,513). Claim 9 was rejected under 35 U.S.C. §103(a) as being unpatentable over Okamoto in view of Müller et al. and Suzuki et al. (U.S. Pub. No. 2002/0068206). Claim 10 was rejected under 35 U.S.C. §103(a) as being

unpatentable over Okamoto in view of Müller et al. and Kaneko et al. (U.S. Pub. No. 2001/0021469). For the reasons discussed below, the Applicants request the withdrawal of the obviousness rejections.

The Applicants note that Claim 1 has been amended to incorporate the subject matter of Claim 6, thereby rendering all obviousness rejections set forth in the Official Action moot, with the exception of the obviousness rejection of Claim 6, which is discussed below.

The basic requirements for establishing a *prima facie* case of obviousness as set forth in MPEP §2143 include (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings, (2) there must be a reasonable expectation of success, and (3) the reference (or references when combined) must teach or suggest all of the claim limitations. The Applicants submit that a *prima facie* case of obviousness cannot be established in the present case because the references, either when taken singularly or in combination, do not teach or suggest all of the claim limitations.

Claim 1 of the present application recites a fuel cell system comprising a fuel tank storing a fuel comprising dimethyl ether, water, and 5-10 wt% of methanol, the mixing ratio of dimethyl ether and water is in a range of 1:3 to 1:4; a vaporizer configured to vaporize the fuel; a reformer configured to reform the vaporized fuel into a hydrogen rich gas; a CO gas removal apparatus configured to remove CO gas in the hydrogen rich gas; and a fuel cell unit configured to generate electricity by electrochemical reaction of the hydrogen rich gas and oxygen.

By way of illustration and not limitation, the present application describes an

embodiment of the invention in which 5-10 wt% of methanol is present within a fuel also comprising dimethyl ether and water as recited in Claim 1, and described on page 8, lines 12-21. The dimethyl ether and water are not separated into two phases, and a desirable stoichiometric composition of fuel can be obtained. The resulting fuel was considered by the inventors to be an unexpected result at the time of the invention.

The Official Action notes that the Okamoto et al. reference does not disclose a fuel that includes dimethyl ether. In addition to the fact that the Okamoto et al. reference does not disclose the above feature, the Okamoto et al. reference also does not disclose the mixing ratio of dimethyl ether and water recited in Claim 1, specifically the mixing ratio of dimethyl ether and water that is in a range of 1:3 to 1:4.

The Official Action cites the Müller et al. reference for the teaching of a fuel that includes dimethyl ether. The Official Action acknowledges that the combination of the Okamoto et al. reference and the Müller et al. reference do not disclose a fuel that includes less than 10wt% methanol. (See last paragraph on page 7.) In fact, the Müller et al. reference do not disclose a fuel comprising dimethyl ether, water, and 5-10 wt% of methanol, where the mixing ratio of dimethyl ether and water is in a range of 1:3 to 1:4. The Official Action indicates that it would have been within the skill of the ordinary artisan to adjust the DME/water ratio in the fuel mixture; however, the Müller et al. reference discusses different concentrations of fuels (see, e.g. Figs. 7a and 7b), and is silent about the unexpected results achieved by the claimed fuel cell system of the present invention.

The Official Action cites the Pan et al. reference for the teaching of a fuel that includes less than 10 wt% methanol. While the Pan et al. reference describes a methanol

concentration sensor and control of the methanol concentration, such as a methanol to water delivery ratio, the Pan et al. reference does not disclose storing a fuel comprising dimethyl ether, water, and 5-10 wt% of methanol, where the mixing ratio of dimethyl ether and water is in a range of 1:3 to 1:4, as recited in Claim 1. Additionally, the Pan et al. reference is silent about the unexpected results achieved by the claimed fuel cell system of the present invention.

Therefore, the Okamoto reference, the Müller et al. reference, and the Pan et al. reference, singularly or in combination fail to disclose or suggest the fuel recited in Claim 1 having, for example, a mixing ratio of dimethyl ether and water in a range of 1:3 to 1:4. The cited references substantially differ from claimed configuration, and cannot achieve the effectiveness of the claimed invention. Thus, the Applicants respectfully request the withdrawal of the obviousness rejection of Claim 1.

Claims 7-11 and 24 are considered allowable for the reasons advanced for Claim 1 from which they depend. These claims are further considered allowable as they recite other features of the invention that are neither disclosed nor suggested by the applied references when those features are considered within the context of Claim 1.

The Applicants note that newly added Claim 25 recites the limitations of original Claim 1, but amended to recite that the fuel tank is a single fuel tank storing a fuel comprising an ether, water, and an alcohol. The Official Action noted on page 4 that the Okamoto reference does not teach a single fuel tank storing a fuel comprising ether, water and an alcohol. The Official Action also does not indicate that the Müller et al. reference teaches such a feature, and in fact suggests it does not teach such a feature, but rather the

Official Action simply states that it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use a single tank because making separate components integral is considered obvious, citing the *In re Larson* decision. (See the first full paragraph on page 4 of the Official Action. The Applicants respectfully traverse this conclusion for several reasons.

First, the Applicants note that an election of species requirement was entered in this case on February 28, 2007 (and made final in the outstanding Official Action), in which two species were identified based upon the fact that Species 1 contains a single fuel tank and Species 2 contains plural fuel tanks. MPEP 806.04(h) states that "Species must be patentably distinct from each other." Thus, a conclusion that a single fuel tank is a mere matter of obvious engineering choice (see quote at the end of the first full paragraph on page 4 of the Official Action) is directly contradictory to the election of species requirement made in this case.

Secondly, the *In re Larson* decision regarding the making of two separate components taught in a reference integral does not result in the claimed single tank. In the *In re Larson* decision, the integration of the two components made use of a one piece construction rather than several parts rigidly secured to one another. (See MPEP 2144.04 V. B.) There is no teaching in the cited references of two tanks rigidly secured to one another. Additionally, the joining together of two tanks, as suggested in the present instance and based on the *In re Larson* decision, would result in two integral tanks (e.g., a unitary housing having two tanks therein separated by a common wall), not in a single tank as claimed. In fact, the present invention as recited in new Claim 25 advantageously provides for the omission of an element

(i.e. the second tank) with the retention of the element's function, which is noted in MPEP 2144.04 II. B. as being an indicia of unobviousness.

Accordingly, the Applicants respectfully submit that new Claim 25 is allowable over the Okamoto et al. and Müller et al. references cited against original Claim 1. Thus, the Applicants submit that Claim 25 and the claims that depend therefrom are in condition for allowance.

Consequently, in view of the above discussion, it is respectfully submitted that the present application is in condition for formal allowance and an early and favorable reconsideration of this application is therefore requested.

Respectfully Submitted,

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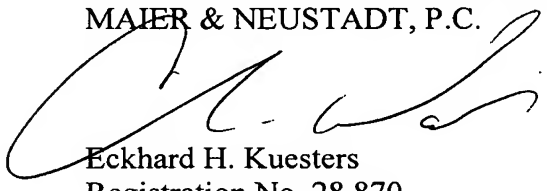

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